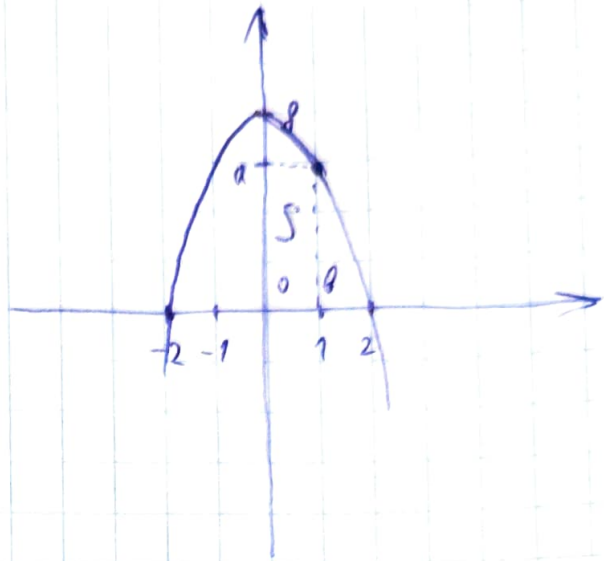
№1

$A(0;0)$ $C(a;v)$

$B(a,0)$ $D(0,v)$




$y = -x^3 + 8$

$S = a \cdot b$

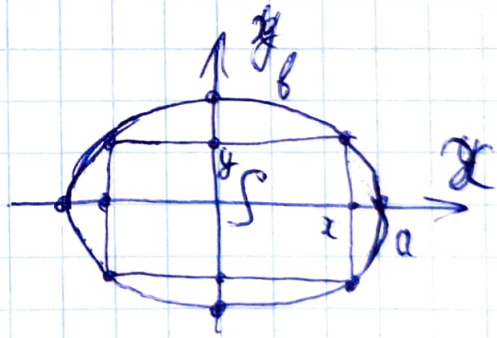
$a = -b^3 + 8$

$S(b) = -b^4 + 8b \to max$

$S'(b) = -4b^3 + 8 = 0$

$b = \sqrt[3]{2} \Rightarrow a = 6 \Rightarrow S_{max} = 6\sqrt[3]{2}$

№2




$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

$S = 2x \cdot 2y$

$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

$x = a\sqrt{1 - \frac{y^2}{b^2}}$

$S = 2a\sqrt{1 - \frac{y^2}{b^2}} \cdot 2y$

$S'(y) = 4a\sqrt{1 - \frac{y^2}{b^2}} + 4y \cdot a \cdot \frac{2y}{2\sqrt{1 - \frac{y^2}{b^2}}\, b^2}$

$= \frac{4a}{b}\sqrt{b^2 - y^2} - \frac{4a}{b}\frac{y^2}{\sqrt{b^2 - y^2}} = \frac{4a}{b}\left(\frac{b^2 - 2y^2}{\sqrt{b^2 - y^2}}\right) = 0$

$\Rightarrow y = \frac{b}{\sqrt{2}}$ $x = a\sqrt{1 - \frac{1}{b^2}\cdot\frac{b^2}{2}} = \frac{a}{\sqrt{2}}$ $S_{max} = \frac{4ab}{\sqrt{2}\cdot\sqrt{2}} = 2ab$